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## **Determinants of Private Investment in Tanzania**

Innocent M. Michael and Jehovaness Aikaeli<sup>\*20</sup>

### **Abstract**

This article investigates the determinants of private investment in Tanzania using Error Correction Model and employing time series data for the period 1975 – 2010. The results show that public investment, GDP growth and credit to private sector are important in explaining growth of private investment but there is no enough evidence that interest rate, exchange rate and degree of openness of the economy have influence on growth of private investment. Policy implications on both fiscal and monetary sides are presented in line with the findings of this article.

**Key words:** Private investment, gross fixed capital formation, Tanzania Investment Centre, GDP growth, credit to private sector

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<sup>\*20</sup> Corresponding Author: Department of Economics, University of Dar es Salaam, Tanzania, Tel: +255 754 593168. Email: [jaikaeli@yahoo.co.uk](mailto:jaikaeli@yahoo.co.uk)

## **1.0 Introduction**

Both domestic private investment and foreign direct investment are the major components of private investment. Domestic private investment in developing countries and particularly in sub-Saharan Africa is characterized by predominance of Small and Micro Enterprises (SMEs), which mostly exploit cheap labour and supply low technology goods and services in the market. One of the main reasons domestic private investment exists in rudimentary forms in developing countries is due to existence of only a few large scale firms in these countries owing to limited capital, *inter alia* (TIC, 2008). For a number of years in the recent past, Tanzania has maintained private investment growth, especially the foreign direct investment due to implementation of favourable policies for the private sector industries (Mnali, 2008). However, the level of domestic private investment still remains a big challenge as regards low level of domestic savings rate, and this amid lack of collaterals needed to access loans from different financial institutions.

Enhancing private domestic investment implies more domestic capital formation in the economy, which is quite healthy to the performance of the country's economic performance since it mitigates productive resources/capital leakages. Nonetheless, Tanzania's situation has been in dilemma because before the 1990s the size of private sector was generally small, and after liberalization, domestic private investors have not yet featured prominently in undertaking large investments. Although there has been some growth in domestic gross capital formation in the recent years, this has been generally driven by public sector investment while domestic private sector investment continued to decline (Mnali, 2008).

Tanzania recorded a gross capital formation of 26.1% and 30.6% as a proportion of GDP in the year of 1990 and 2010 respectively, which is still too low relative to its desired role of fostering economic growth at the levels that are adequate for sustainable per capita income growth. Considering the immense contribution of private sector to growth of the economy, it is imperative to recognize a crucial role of private capital formation; and this therefore underpinning investigation of the determinants of private investment in the country.

The rest of the article is organized as follows. Section two provides an overview of investment in Tanzania while Section three discussed literature review, including both theoretical and empirical issues. Section four provides conceptual framework, while Section five dwells on empirical analysis and the last Section presents conclusion and policy implications based on the empirical results.

## **2.0 Overview of investment in Tanzania.**

Tanzania has made considerable improvement on investment since Economic Recovery Program of 1986. In order to accelerate investment in the country, Tanzania decided to reform its Investment Policy in 1996/97 with a view of providing better investment climate for both domestic and foreign investors. Investment Policy came up with the establishment of Tanzania Investment Centre (TIC) that assists all investors to obtain necessary permits, authorizations, approvals, registrations, consents and other related matters that are required by the law for a firm to setup and operate investment in the country. Since its operation, the centre contributes

significantly to information dissemination to investors regarding investment climate and areas for further investment by foreign and/or domestic investors, among others.

Private investment in Tanzania has generally been increasing overtime as the harnessing of some potential resources continues, notably the extraction of minerals, forest products, construction (of hotels and beach resorts), trade and services, to mention a few. This recent outcome is different from the era before liberalization of the economy when public investment was proportionately significant owing to the large size of the government, i.e. stifling of private sector and dominance of public capital. Highest shares of public investment to GDP since independence were recorded in 1977 and 1990, amounting to 11% and 14.5%, respectively, while percentage of private investment to GDP were 8.4% and 16.94% during the same years. In the post 1999, however, the private investment has recorded a rising trend from 16.2% of GDP in 1995 to 22.5% of GDP in 2009. This was associated with privatization of public companies in the 1999, and allowing foreign private investment (FPI) inflows into the economy where by more than 400 companies were privatized, which was approximately over 80% of the government enterprises.

Although private investment has been increasing, private saving in Tanzania has generally been low and its trend is mixed. Private saving increased in the 1970s and 1980s; but it dramatically decreased to -10% during 1992/93 and later increased, reaching 13% in 2010. The recent increase in private saving in the country also accentuated a rise in credit to private sector to the tune of 16% of GDP in 2010. Importance of domestic investment is well reflected when, for example, we consider the financial crisis that occurred in 2007, which led to a slump in foreign investment in Tanzania from 8.4% in 2005 to 3.6% in 2008 as a ratio of foreign investment to GDP respectively, and so leaving domestic investment as the cushion of the production activity. While addressing the question of private investment, it should be noted that it is not without appreciating the role of private sector investment in the country. Back in the history lane, we have evidence of the positive role of infrastructure development including Tanzania-Zambia Railway (TAZARA), Tanzania-Zambia *Mafuta* (TAZAMA) and construction of roads networks that have attracted domestic and foreign investors to various sectors across the country. It is envisaged that the construction of Bagamoyo and expansion of Tanga harbours, which are under the plan, will enhance trade networks with the East African Community (EAC) and Southern Africa Development Community (SADC) countries. While transport infrastructure is being prioritized, there is a view that more remains to be done especially regarding investment in railway networks across the country, as well as production and supply of assured and reliable electric power. Among the ways these investments could be done is through public-private-partnership (PPP). Nonetheless, a lingering challenge is about the possibility of being able to effectively involve domestic investors in such high capital investment projects.

### **3.0 Theoretical and empirical perspectives**

Investment like any other economic outcomes depends on incentive behind it and this economic incentive is nothing else but returns to investment. The general theory of own rates according to John Maynard Keynes as explained by Wray (2008) provides a picture on how the rate of interest is determined in the capitalist economy. Every durable asset has its own rate of return and can be stated in terms of money. The expected return to an asset, which is measured in monetary terms

can be denoted,  $q - c + l + a$ , where  $q$  is the asset's expected yield,  $c$  is carrying cost,  $l$  is liquidity position, and  $a$  is expected gain from a change in price, that is appreciation. Composition of returns vary by assets, with most of the return to illiquid assets such as capital accruing  $q - c$ , while return to holding liquid assets accrues  $l$  component. Increased confidence about future economic performance of the economy raises the assets expected yield while lowering the subjective values assigned to liquid positions (i.e. the  $l$  falls), which means the marginal efficiency of capital rises relative to that of assets that get much of their return from  $l$ , implies increase of investment. In view of this, when we are looking at the investment status, the question of quality of investment climate is relevant since it is the one that assures high  $q$  and low  $c$ .

One of issues related to investment differences across countries is the extent to which financial markets are developed and the easy with which investment finance can be done. However, under some conditions, the decision about how much to invest is independent of the decision about how to finance investment, since the value of the firm stock of capital is the same regardless of whether the firm issues bonds (and so becoming highly leveraged) or uses retained earnings or proceeds from issuing new equity. Modigliani-Miller (1958) theorem demonstrates under conditions of perfect capital market that, the cost of investment of the firms is the same regardless of which of the method is used in capital finance. Notwithstanding the strength of this theorem, asymmetric information and capital market imperfections lead to some important exceptions to the Modigliani-Miller postulation.

Hall and Jorgenson (1967) provide a neoclassical approach to capital investment, showing that the optimal stock of capital is a function of output level, rate of depreciation and user cost of capital within a symmetric information market where investors are indifferent in undertaking different investment projects. The neoclassical theory puts it clear that optimal capital stock depends on the price of capital goods and real interest rate. It is important to note that interest rate works from two dimensions, as cost of funds (deposit rate – which is relevant to lenders deposits mobilization) and as cost of loans (lending rate – which is relevant to borrowers credit access). Tanzania in particular can be reflected on this argument since there has been impression over time that the margin between these rates is substantial, that lending rates are too high (discouraging borrowers from credit financing) and deposit rates are too low (discouraging savers from keeping deposits in financial institutions).

According to Tobin (1969), in a market where capital valuation can be done fairly (i.e. where stock market is doing well) optimal capital stock can be determined by the market value of capital stock relative to its replacement cost. When the ratio of market value to replacement cost is high it implies that a firm will expand/acquire more capital/investment. This is one of the neoclassical theories of investment, which is referred to as  $q$ -theory. There is substance in the postulation of this theory although it can be empirically limited in a situation like Tanzania

where capital market is still at its infant stage and thus it may be difficult for firms to precisely approximate their average market values of capital<sup>21</sup>.

There is a strand of argument in the literature that gives emphasis to the profit motive as a driving force of private investment (Branson, 1979). Using the present value (PV) criteria, the argument is that investors do undertake those projects whose discounted present values are positive,  $PV \geq 0$ . This simply means an investor will choose investment projects with returns that are, by any means, not less than their costs. This understanding is logical and does make sense to all rational investors whether in advanced countries or developing world like in this case of Tanzania. Further, we get impression that if the country wants to enhance private investment; it has to reduce cost of capital in pursuit of high PVs of investments for more capital placements in the economy.

In modern economics there have emerged a good number of theorists who have attempted to attribute investment outcomes to internal conditions in the perspective of endogenous growth theory. Related to the same view, human capital and labour force are regarded as important ingredients of the economy's total capital stock and as complimenting factors to productivity of physical capital. Because performance of any macroeconomic variable is usually ascribed to integration of several factors, and that investment process should generally be guided and coordinated. Political regimes and policy environment are also considered relevant when one evaluates investment outcomes (Romer, 1986; Rodrik, 1991). Regarding these arguments, Tanzania is not an exception since the background of investment trend of the country reflects different pictures across political regimes and policy environments.

On the empirical front, different studies in Africa, Asia, and Latin America have attempted to show what determine private investment at national and sectoral levels. Salman (2011) applied Error Correction model in a study of empirical analysis of private investment in Pakistan, and the results show there is negative relation between balance of trade and foreign private investment. It is intuitively correct that if balance of trade is improving, it implies that there is some gain in terms of external competitiveness and that is a good reason for more capital investment. This understanding is so whether we are talking about advanced or developing country. An investor is after returns and growth of the value of the firm, therefore, improvement in the external balance is an obvious incentive to investment.

Magnus (2010) in Ghana used autoregressive distributed lag (ARDL) model to study investment behaviour. The results show that degree of openness of the economy is negatively related to investment, while inflation is positively related to investment, which means trade openness and high prices are critical in motivating investment. In our opinion, these results seem counterintuitive in the sense that, so far there is no firm evidence that protection can be better

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<sup>21</sup> The practice in the context of this theory is to ascribe value of capital from the public valuation which is done through security prices. In developing economies and Tanzania in particular, most of firms are not listed in the securities market, and even those few that are listed have a low market capitalization. Most of their capital is sourced from other avenues than stock market.

than openness. For instance, in the 1970s most of the economies that attempted import substitution industrialization policy did not succeed, Tanzania inclusive. Further, there is theoretical and empirical reasoning that though inflation rate of zero is suboptimal, high inflation handicaps investment, especially due to increased uncertainty/risk. Under the normal scenario of performance of the economy, it would be better using interest rate as a relevant price component in investment study than consumer price inflation. Nevertheless, there is no one cut off point as to whether a variable should be included in the model or not, if for instance the economy has been going through high inflation, considering inflation as one of factors affecting investment is quite reasonable.

Valadkhani (2010) examined determinants of private investment in Iran using Johansen multivariate cointegration technique and a short-run dynamic model. The results show that an increase in inflation in the long-run by 1% can immediately result in 1% decrease in investment in the short-run. This study concludes that in the short-run, growth of non-oil GDP is one of the main determinants of the growth of private investment in Iran. Sector-wise, it seems much more of new private investment of Iran is on non-oil sectors, otherwise, it can be difficult giving explanation on the reason oil sector GDP does not reflect on investment growth. This does not make a lot of sense for oil exporting economy; probably further study may be useful to robustness of this result and also reasoning for such finding.

Determinants of private investment in large scale manufacturing sector of Pakistan were studied by Ahmad, (2009). Cointegration approach was employed to investigate dynamics of private investment and concludes that public development expenditures enhance private investment while public non-development expenditures tend to depress private investment. This study involves variables that can be important for our study since one of outcry in the recent years is that Tanzania has been putting too much of its budgetary allocations on recurrent expenditure rather than development expenditure. Further, deficit finance can be a source of decline in private investment owing to crowding out effect on the private sector finance.

Khaliq (2007) in the study on foreign direct investment (FDI) and economic growth using annual data for twelve sectors of Indonesia, employed fixed effect estimation technique and found that private investment has positive relationship with economic growth. At aggregate level, foreign direct investment appears to have a positive effect on economic growth. However, at sectoral level, the effects of FDI on economic growth vary across sectors. Growth of the economy has a good implication as regards market and scale of production. This finding is intuitive for any economy since we expect to see investor chasing opportunities in growing economies as they are sure of high returns. Evidence in the recent years can be drawn from the influx of western firms in the South-East Asia due to high growth and surpassing performance of those countries. Nonetheless, it is important to understand that growth is a function of several factors including in particular the proper management of the economy, which in its own right it is an attraction to private investors.

Liberalization of the market to allow foreign and domestic investment needs government involvement in developing conducive environment that allow use of capital by multidimensional

companies to engage in production of goods and services. Mnali (2008) on the study of investment climate and opportunities in Tanzania shows importance of domestic savings as a key component in boosting domestic investment. The improvement in saving habit by indigenous population allows more investment by those who have opportunities to invest through borrowing from financial institutions at a desired rate of interest that will create employment and thus raising incomes of the majority through multiplier process.

Private investment, and more especially its domestic component hinges on domestic resources mobilization by the financial institutions. If deposit rate is too high, resources mobilization becomes difficult. Ndikumana (2000) on the study of financial determinants of domestic investment in sub-Saharan Africa shows negative relationship between deposit interest rate and growth of private investment. If the level of interest rate becomes negative or positive but too low, it discourages those who have excess money from depositing in financial institutions. This simply means low savings, which in turn leads to low level of investment. A case of Tanzania can be slightly different from this that in the recent years some complains have been levelled against keeping excess liquidity (i.e. idle resources) in financial institutions despite a high demand for capital finance by the private sector (Aikaeli, 2011). Some factors are mentioned as a cause including among others the credit risk. Nonetheless, lending rate (price of loans) was not considered in Aikaeli's study. In this study, lending rate is included as one of the explanatory variables to find out whether financing cost burden is among the reasons investors shun away from using the readily available resources to boost investment in the country.

#### **4.0 Modelling determinants of investment in Tanzania**

There is no one generally accepted model of investment processes that caters for all economies, and so we need to fit a model that suits the environment of our study. The empirical approach to this study is not hinged on maximization of the goodness of fit of the model, but in the fore front, on inclusion of key variables that are relevant in explaining the Tanzania's case. The study starts by employing a framework developed by Hall and Jorgenson (1967) and then augments it to provide the useful model that fits Tanzania's situation.

Consider a hypothetical case of a firm that produces output by using only capital from the market, and it pays interest  $\phi_t$  for the use of a unit of capital.

$$y = f(k) \tag{1}$$

For a period  $t$ , the firm maximizes profit, assuming  $f(k)$  follows Cob-Douglas production function, the firm has to optimize by producing the best possible, that is by maximizing its output and of course minimizing cost of capital,

$$\max k_t^\alpha - \phi_t k_t$$

Taking the first derivative of this expression with respect to capital we get,

$$\alpha k_t^{\alpha-1} = \phi_t \tag{2}$$

$$\alpha y_t / k_t = \phi_t \tag{3}$$

$$k_t = \alpha y_t / \phi_t \tag{4}$$

Equation (4) shows that capital is directly related to output and inversely related to interest on capital. When a firm needs to produce more output, more capital will be required (assuming no excess capacity) and also when interest charged on capital rises will discourage firm to use more



units of capital. To determine the cost of capital in a simple economy with no taxes and no capital market frictions (with symmetric information), an investor must be indifferent between depositing her money in banks to earn interest,  $r_t$ , and buying a unit of capital for renting it out at the rate  $\phi_t$ , and then to resell it in the next period. Suppose the price of capital goods bought at period  $t$  is  $P_t$ , and it is in continuous time case; the rate of change of  $P_t$  is  $P_t'$ ; and capital depreciates geometrically at a rate  $\delta$ . Profit from continuous time purchase and rent strategy is,

$$\phi_t - \delta P_t + P_t' \quad (5)$$

This accounts for income from renting minus loss from depreciation plus capital gain from a change in price of capital. The no arbitrage condition is

$$rP_t = \phi_t - \delta P_t + P_t' \quad (6)$$

$$(r + \delta)P_t = \phi_t + P_t' \quad (7)$$

Assuming the price of capital good is at equilibrium ( $P_t' = 0$ ). Substituting equation (7) into (3) we get,

$$k_t = \alpha y_t / \phi_t \quad (8)$$

$$= \alpha y_t / (r + \delta) P_t \quad (9)$$

With introduction of  $\varphi$  as investment tax credit and  $\tau$  as corporate income tax rate, the net, discounted, after-tax price of capital ( $\omega_t$ ) is written as,

$$\omega_t = (1 - \varphi) P_t \quad (10)$$

With no arbitrage, equation (6) results in

$$(r + \delta)\omega_t = (1 - \tau)\phi_t + \omega_t' \quad (11)$$

$$\phi_t = \frac{(r + \delta)P_t(1 - \varphi)}{1 - \tau} \quad (12)$$

where  $\omega_t' = 0$ .

Equation (12) shows relationship between some explanatory variables (lending rate, deposit rate, depreciation of capital, corporate tax and investment tax credit) on one side and capital on the other side. But net investment is the difference between capital stock in time  $t$  and  $t-1$ . Therefore, Gross investment is written as:

$$i_{t-1} = k_t - k_{t-1} + \delta k_{t-1} \quad (13)$$

$$= (\Delta y_t / \phi_t) \alpha + \delta k_{t-1} \quad (14)$$

Equation (14) explains that gross investment is the function of change in output, rent and depreciation of the last period's capital. This equation provides a base for empirical analysis but in sub-Saharan African countries including Tanzania, the degree of openness of the economy and exchange rate are likely to be significant in explaining investment performance.

Because investment process is influenced by both the short-run and long-run dynamics of its driving forces, for empirical estimation of the determinants of private investment in Tanzania, we use Error Correction Model (equation 15), which defines private investment as a function of public investment, exchange rate, degrees of openness of the economy, lending rate, GDP growth, and credit to private sector, that is

$$PI_t = \beta_0 + \beta_1 PUB_t + \beta_2 EXCH_t + \beta_3 CREDIT_t + \beta_4 GDP_t + \beta_5 LEND_t + \beta_6 DOP_t + ECT_{t-1} + \mu_t \quad (15)$$

Where  $\beta_1, \beta_3, \beta_4 > 0$  and  $\beta_2, \beta_5 < 0$  while  $\beta_6$  is either positive or negative depending on the magnitude of exports and imports.

Variables in equation 15 are defined as follows:  $PI_t$  is private investment (which is the dependent variable), this consist of private domestic and foreign investments, and is calculated as a difference between total capital formation and public investment expenditure as a proxy for it. This is considered right because the total capital formation covers investment by private and public sectors.

$PUB_t$  is the public investment which is defined as the investment in physical infrastructure made by the central government, local governments and public corporations calculated as the total investment expenditure made by the government over the period of study.

$EXCH_t$  is the exchange rate, defined as average amount of Tanzanian shilling needed to buy one US dollar in period  $t$ .

$CREDIT_t$  is the credit to private sector defined as the total financial resources allocated to private sector, and calculated as a sum of all credits provided by financial institutions to private sector according to the Bank of Tanzania statistics.

$GDP_t$  is the gross domestic product defined as the sum of investment, consumption, government expenditures and net export according to the national accounts.

$LEND_t$  is average lending interest rate charged when investors borrow money from financial institutions.

$DOP_t$  denotes the degree of openness of the economy, it is calculated as the ratio of the sum of import and export to GDP.

$ECT_{t-1}$  is the error correction term, which is obtained by regressing dependent variable on independent variables and then we produce residual series from the estimated ordinary least square. It is this term that measures the speed of adjustment of the dependent variable as the independent variable(s) changes.  $\beta_0$  is a constant, and  $\mu_t$  is an error term.  $\beta_i, i = 1, 2, \dots, 6$  are coefficients of the respective variables.

## **5.0 Empirical analysis**

### **5.1 Descriptive statistics**

Table 1 provides descriptive statistic of the individual sample series. As it shows, the average value of private investment is TZS 1,118,399 million with standard deviation of 1,918.9 Also the average value of public investment was TZS 451,052 million with dispersion of 643.3. The probabilities of Jacque-Bera test for individual variables of private investment, public investment, and GDP are less than 5% level of significance implying that, they are normally distributed but lending rate, exchange rate and degree of openness of the economy are not. These indicate that when taking variables in a separate version they are not all normally distributed around the mean.

**Table 1: Descriptive statistics**

Statistic\ Variable	Private investment	Public investment	Lending rate	GDP	Credit	Exchange rate	Degree of openness
Mean	1,118,399	451,052	17.9	6,339,135	722,917	500.6	0.32
Median	25,0866	185,485	15.4	1,547,705	182,762	357.4	0.33
Maximum	7,639,049	2,611,306	35.9	32,293,479	5,203,578	1,453.5	0.51
Minimum	1070	1,693	7.5	19011	3123	7.41	0.17
Std. Dev.	1,918,961	643,312	8.3	8,881,330	1,344,037	498.3	0.09
Skewness	2.10	1.83	0.6	1.4	2.1	0.49	0.05
Kurtosis	6.49	5.74	2.3	4.2	6.5	1.76	1.82
Probability of JB	0.000	0.000	0.2	0.000	0.000	0.15	0.35

**Source:** Authors estimate

### Ordinary Least Square regression

In testing the signs of parameters of independent variables, OLS regression was employed as shown in Table 2. All signs of the respective variables coincide with hypotheses underlying inclusion of these variables. Lending rate and exchange rate are negatively related with private investment while public investment, degree of openness of the economy's GDP and credit to private sector are positively related to private investment. The use of annual data in regression analysis may lead to spurious results especially if not tested for stationarity. Unit root test is developed to see if the data are stationary.

**Table 2: Ordinary least square regression results.**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PUBLIC)	0.303646	0.136794	2.219735	0.0344
LEND	-0.001839	0.007707	-0.238638	0.8131
LOG(GDP)	0.657762	0.195911	3.357459	0.0022
EXCH	-0.000101	0.000379	-0.266401	0.7918
DOP	0.860286	0.536072	1.604794	0.1194
LOG(CREDIT)	0.208693	0.070785	2.948288	0.0063
Constant	-3.546496	1.095384	-3.237675	0.0030
R-squared	0.998336	Mean dependent var		11.71545
Adjusted R-squared	0.997992	S.D. dependent var		2.790092
Log likelihood	27.66282	F-statistic		2900.241
Durbin-Watson stat	1.611828	Prob(F-statistic)		0.000000

### Unit root test

If a time series is stationary it implies that its mean, variance and auto-covariance are constant, no matter at which times we measure them. In a classical linear regression, the use of non-stationary variables is likely to give spurious results which can mislead predictions/forecasting and policy information. Therefore, it is important to make sure all variables used in time series are stationary (which is done by a test of unit root) before doing any further work in estimations.

Philips-Peron test for unit root are used to test the stationarity of variables at levels and at the first difference. This test is preferred because it takes into account all structural breaks that have occurred in the economy. Table 3 shows that all variables are integrated of order one and they are stationary at their first difference.

**Table 3: Unit root test results (at levels and at first differences)**

Variable	Adj. t-statistic at level	Adj. t-statistic at 1 <sup>st</sup> difference	Critical value at 5%
Credit	-3.097720	-3.097720	-2.951125
Degree of Openness	-4.920193	-4.920193	-2.951125
Exchange rate	-4.461704	4.464968	-2.951125
GDP	-3.222431	-3.222431	-2.951125
Lending rate	-5.087115	-5.087115	-2.951125
Private investment	-5.028597	-4.964044	-2.951125
Public investment	-5.308069	-5.247272	-2.951125

**Source:** Authors estimation

**Note:** All variables are in logarithms except lending rate and degree of openness.

Since all variables are integrated of the same order, cointegration test is performed using Engel-Granger test for cointegration to see if these variables have a long-run relationship, i.e. whether they wonder together as time goes. This is done by estimating a simple static private investment model and then test for stationarity of a residual series. The results indicate that residual series is stationary at the level with adjusted *t*-statistic of -8.3563 and critical value of -4.2529, and that is at 5% level of significance. The stationarity of the residual series suggest a long-run relationship of the variables under the study.

### **5.3 Estimation of error correction model**

Because the series are integrated of the same order, it straightforwardly allows the model to be estimated by error correction mechanism. This approach enables the long-run and short-run dynamics to be estimated simultaneously. Using Akaike information criteria or the lag length, the model starts from general to specific by including maximum of three lags of each variable and then insignificant variables are dropped out until we reach the parsimonious results as presented in Table 3 below.

**Table 4: Estimates from error correction model**

Dependent variable: Private investment				
Variable	Coefficient	Standard error	t-statistic	P-value
Constant	-0.8519	0.06075	-1.4024	0.1726
Public Investment	0.3038	0.1291	2.3535	0.0264
Lending rate	-0.1009	0.198	-0.5096	0.6146
GDP growth rate	0.9484	0.3463	2.739	0.011
Exchange rate	-0.1517	0.1368	-1.1094	0.2774
Openness	0.1468	0.1781	0.8242	0.4173
Credit	0.4235	0.1752	2.4168	0.023
ECT (-1)	-0.3327	0.1583	-2.1016	0.0454
R-squared	0.6875			
F-statistic	8.171014			
Adj. R-squared	0.6033			
P-value of F-statistic	0.000029			
DW	2.184489			

As shown in Table 4, F-statistic rejects the joint null hypothesis that all coefficients of independent variables are equal to zero. In our study we have been able to establish that, public investment, GDP growth and enhanced credit to private sector are significant drivers of private investment. There is significant positive relationship between private investment on one side and growth in public investment, credit to private sector and GDP growth rate on the other<sup>22</sup>, and that is in line with the hypothesized relationships. The coefficient of error correction term is negative implying that private investment converges to its long-run equilibrium as time goes. The coefficient of error correction term shows that about 33% of the adjustments of private investment are explained in the short-run while 67% occurred in the long-run, which implies that it will take about three years to converge completely to the equilibrium. Post estimation test show that residual series are normally distributed, homoskedastic and no serial correlation. The tests involved are Jacque Berra for normality, ARCH and Berusch-Godfrey for serial correlation as well as LM test.

## **6.0 Conclusion and policy implications**

Public investment is one of the means of facilitating private investment, and so if the public sector fails in playing its role, private sector as engine of growth of the economy is stifled. In view of this, it is necessary to note that the government has got an integral responsibility to play through fiscal policy to enhance investment and hence economic growth and welfare as the ultimate end. The other implication that comes clearly in this study is that Tanzania can increase the level of private investment through increased credit allocation to private sector by the financial institutions. Further, this means reducing crowding out of private sector in credit market is quite positive to investment performance. Regarding growth of the economy, the conclusion we have is that domestic absorption capacity, which goes in tandem with output growth is imperative for more investment. Growing income is not only an attraction to investors

<sup>22</sup> All are significant at 5% level.

in the current period but also an indication of possibility for further growth of businesses as a result of consumption multiplier.

About public policy, the implication is that there is a need for reconfiguration of the national budget in the manner that boosts allocations to development expenditure as one of ways to enhance private sector investment. Reducing some dispensable recurrent expenditure to boost development finance is pertinent to growth of private investment. Infrastructure development including provision of social amenities, construction of railways, roads, harbours and airports can make a big push to private investment in the country. Giving priority to growth driving sectors of the economy will make good results in terms of private investment growth. Strategic approach to poverty reduction and income enhancement is therefore necessary to investment growth and thus assurance of sustained growth of the economy since there is intertwined re-enforcement between income growth and investment.

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